

served if the whole diameter of the mirror is employed to reflect light ; and therefore it may have the small mirror convex like Cassegrain's reflector, or plane like Newton's. We can speak with confidence of the excellence of the instrument we allude to, and we gladly bear this testimony to the merit of an obscure individual who, we have reason to believe, is now deceased. He was tenacious of his optical knowledge, and reserved in speaking of it ; yet he was far from an illiberal character. His mirrors were cast by himself in his own house, and every other part of the workmanship of his instruments, and the tools with which they were made, were constructed by himself. In solitude and silence, by day and by night, though surrounded by the chilling difficulties of poverty, he seems to have pursued his studies with an assiduity seldom paralleled ; and the knowledge which it cost him so much to acquire he might feel it difficult to part with to a casual acquaintance. Perhaps the notice we have taken of him in this place may be more than is called for by any proof we have given of his abilities in the new arrangement of a telescope, but the example may be an encouragement to others, and ought not to be lost."

1895 April 2.

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*Note on the Observations for Coincidence of the Collimators in Flexure Determinations with the Transit Circle of the Royal Observatory, Greenwich.*

(Communicated by the Astronomer Royal.)

In the Introduction to the *Cape Catalogue* for 1885 Dr. Gill (p. 35) repeats the suggestion made by Professor Newcomb ("North Polar Distances of the Greenwich Transit Circle," p. 416) that a possible cause for the apparent change of flexure of the transit circle since the piercing of the cube in 1864 September may be found in the systematic error introduced in viewing the wires of the collimator through the cube. Some observations for coincidence of the wires of the N. and S. collimators, viewed respectively through the cube and with the transit circle raised, were made in 1884 and 1885 to test this point, but by inadvertence this was not mentioned in publishing the resulting flexure determinations, and the readings for coincidence of the collimator-wires by the two methods were not given. This seems a favourable opportunity for placing them on record.

Determinations of flexure were made according to the following scheme :—

- (1) Ten readings of S. collimator on N. collimator through the cube.
- (2) Ten circle readings on each of the collimators.
- (3) Ten readings of S. collimator on N. collimator through the cube.

(4) Ten readings of S. collimator on N. collimator with the transit circle raised.

(5) Ten more readings of S. collimator on N. collimator with the transit circle raised.

(6) Ten readings of S. collimator on N. collimator through the cube.

(7) Ten circle readings on each of the collimators.

(8) Ten readings of S. collimator on N. collimator through the cube.

The reversion-prism eye-piece was employed in these observations except on 1885 May 20, so as to eliminate any personality depending on the apparent direction of measurement.

This lengthy programme was not always fully carried out.

The results of the observations, as far as they refer to the readings of the collimators, are given in the following table :—

*Readings of Micrometer of S. on N. Collimator.*

| Date.            | Observer. | Through Cube.  | Through Cube.  | Transit Circle raised. | Transit Circle raised. | Through Cube.  | Through Cube.  |
|------------------|-----------|----------------|----------------|------------------------|------------------------|----------------|----------------|
| 1884.<br>Sept. 8 | A.D.      | r<br>.362      | r<br>.368      | r<br>.362              | r<br>.367              | r<br>.373      | r<br>.379      |
| 29               | H.        | { .092<br>.084 | { .087<br>.077 | { .071<br>.081         | ...<br>...             | .079           | ...            |
| Oct. 5           | E.        | { .413<br>.417 | { .413<br>.418 | { .423<br>.422         | { .450<br>.451         | { .464<br>.473 | { .465<br>.469 |
| 20               | H.T.      | .284           | .280           | .279                   | ...                    | .259           | .267           |
| 1885.<br>May 20  | T.        | r<br>.347      | r<br>.353      | r<br>.348              | ...<br>...             | r<br>.350      | r<br>.348      |

The value of 1 rev. of the micrometer is  $24''\cdot 17$ .

On 1884 September 29 and October 5 the observers took 20 readings in each case. The means of the first and second 10 readings are set down separately.

On October 5, between the two sets of observations with the transit circle raised, readings of the N. on the S. collimator were taken. The progressive change in the readings was probably due to the Sun shining on the S. collimator.

The following table shows the means of the readings respectively through the cube and with the transit circle raised, and the differences :—

*Reading of Micrometer.*

| Date.   | Through Cube.  | Transit Circle raised. | Difference.     | Difference expressed in Arc. |
|---------|----------------|------------------------|-----------------|------------------------------|
| Sept. 8 | r<br>.370      | r<br>.365              | r<br>+.005      | "<br>+.12                    |
| 29      | { .086<br>.084 | { .071<br>.081         | { .015<br>+.003 | { .36<br>+.07                |
| Oct. 5  | { .439<br>.444 | { .437<br>.437         | { .002<br>+.007 | { .05<br>+.17                |
| 20      | .272           | .279                   | -.007           | -.16                         |
| May 20  | r<br>.349      | r<br>.348              | r<br>+.001      | "<br>+.02                    |

The mean of the quantities tabulated in the last column is + 0''.09. Only one-half of this difference affects the flexure, so that the difference in the horizontal flexure obtained by taking the observations through the cube instead of with the transit circle raised is only + 0''.045.

*Observations of Occultations of Stars during the Total Eclipse of the Moon on 1895 March 10, made at the Royal Observatory, Greenwich.*

(Communicated by the Astronomer Royal.)

The night was very clear till after totality ended, so that altogether 139 occultations of stars were recorded by eleven observers : twelve of these are bracketed as being presumably erroneous, five of them are solitary observations of the disappearance of 10th or 11th magnitude stars, and the times of disappearance of two stars were noted by only two observers, and as there was a discordance of several seconds between them no reliable mean could be taken. Omitting these, there are 120 good observations of disappearance or reappearance.

The observers and instruments used are given in the following table :—

| Observer's<br>Initials. | Observer's<br>Name. | Instrument.  | Aperture.<br>in. | Power. | Clock used.    |
|-------------------------|---------------------|--|------------------|--------|----------------|
| D.                      | Mr. Dyson           | Merz Equatorial  | 13               | 220    | Dent 1793      |
| L.                      | Mr. Lewis           | 28-inch Equatorial                                       | 28               | 200    | Dent 2009      |
| H.                      | Mr. Hollis          | { Guiding Telescope of<br>Astrographic Equa- }<br>torial | 10               | 225    | Dent 2017      |
| A.C.                    | Mr. Crommelin       | Sheepshanks Equatorial                                   | 6.7              | 55     | Earnshaw       |
| B.                      | Mr. Bryant          | Altazimuth   | 4                | 100    | Graham I.      |
| G.E.N.                  | Mr. Niblett         | Corbett Equatorial                                       | 6                | 200    | Dent 2009      |
| A.E.                    | Miss Everett        | { Simms' Portable Tele- }<br>scope, No. 1                | 4                | 60     | Arnold 84*     |
| H.F.                    | Mr. Furner          | { R. O. Detached Tele- }<br>scope, No. 1                 | 4                | 60     | Appleton 484*  |
| C.D.                    | Mr. Davidson        | { R. O. Detached Tele- }<br>scope, No. 2                 | 4                | 60     | Loseby 111*    |
| D.E.                    | Mr. Edney           | { R. O. Detached Tele- }<br>scope, No. 3                 | 4                | 60     | Kullberg 5226* |
| J.                      | Mr. Johns           | Astrographic Equatorial                                  | 13               | ...    | Dent 2017      |

\* Chronometer.